

The logo for CEA (Commissariat à l'énergie atomique et aux énergies alternatives) features the lowercase letters 'cea' in a white, rounded, sans-serif font. A horizontal green line is positioned below the letters.

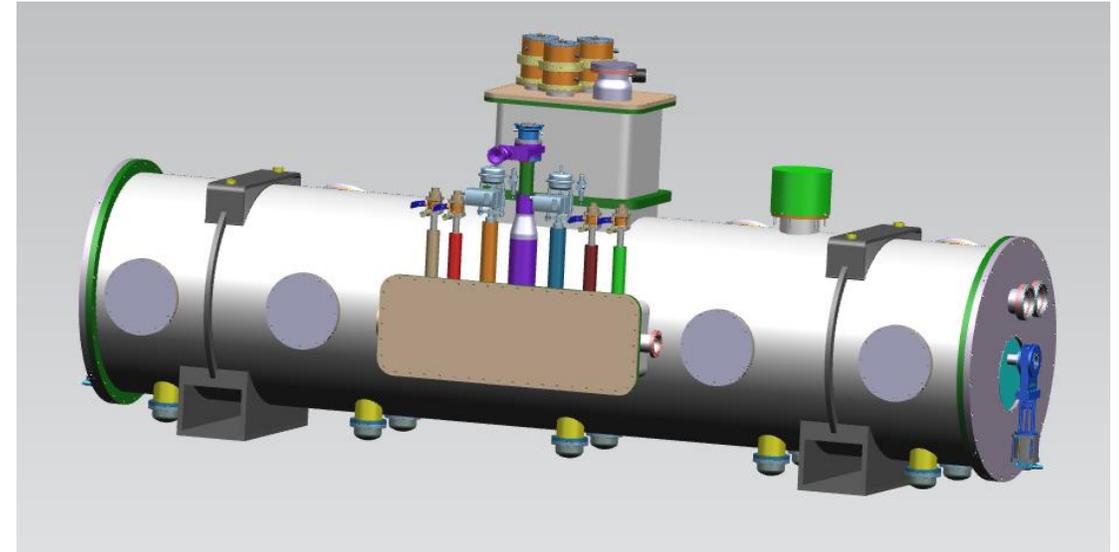
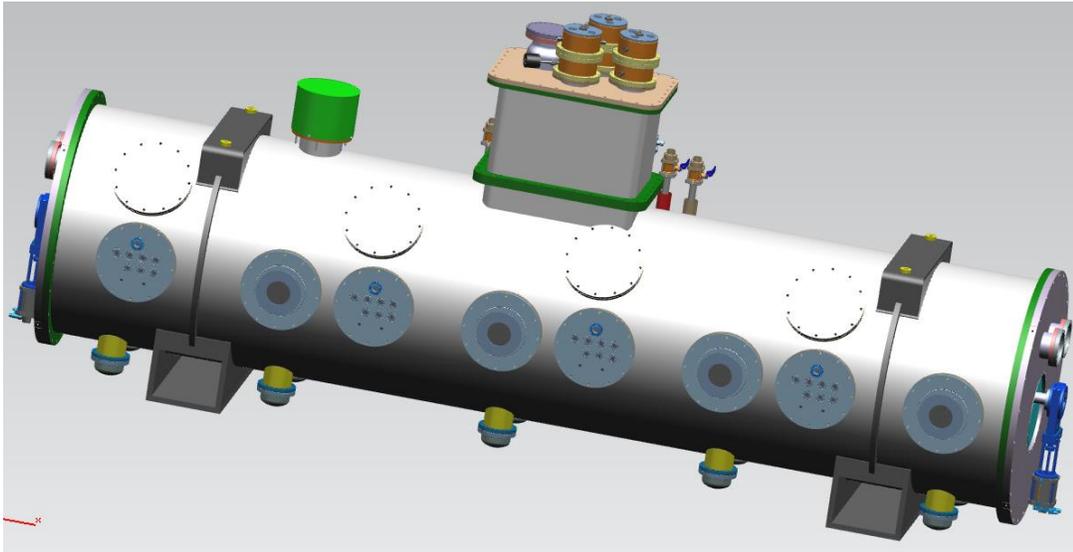
DE LA RECHERCHE À L'INDUSTRIE



Instrumentation LB650 Cryomodule

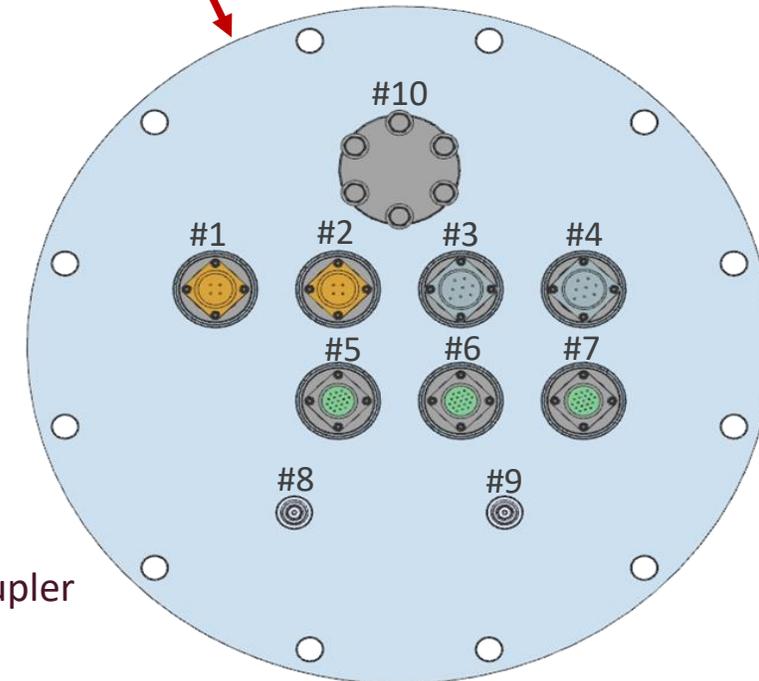
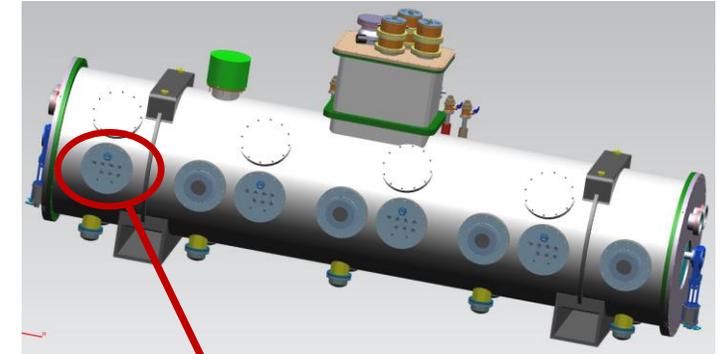
Claire SIMON

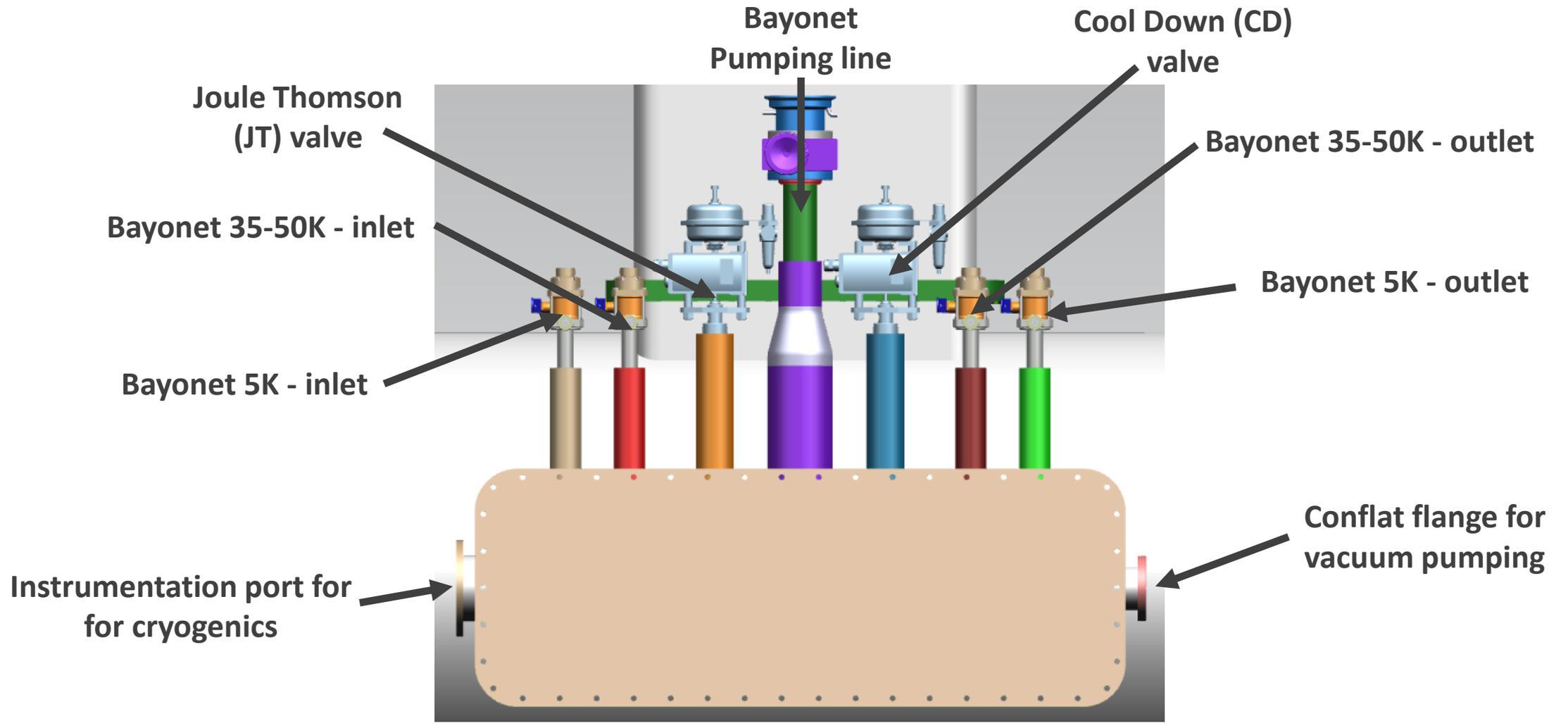
- ▶ Temperatures sensors, heaters, pressure transducers are defined like for the HB650 Cryomodule.
- ▶ Most of the instrumentation are on Connectors Mounted on Flanges
- ▶ The instrumentation is defined flange by flange
- ▶ All Instrumentation will be supplied by Fermilab

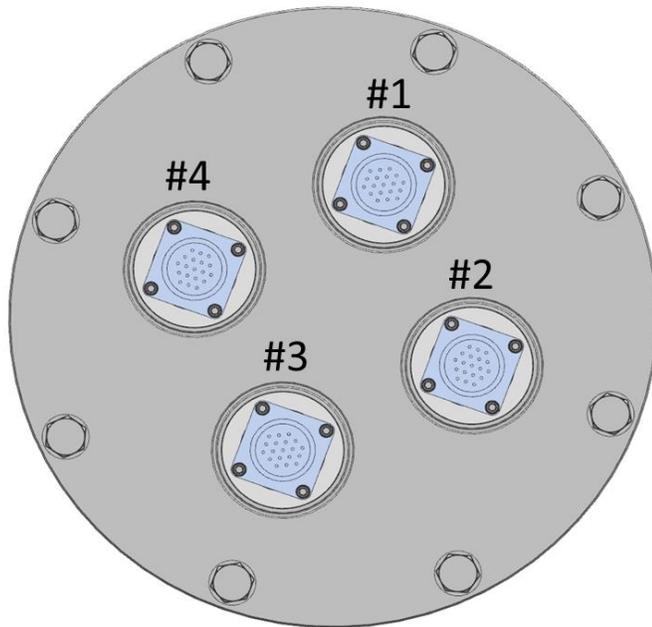


► 4 Main instrumentation flanges (Flange ISO F) are installed along the cryomodule

- Connector # 1:
 - 1 heater on each cavity
 - 1 heater on Helium container (flange n°3)
- Connector # 2:
 - 2 heaters per coupler
- Connector # 3:
 - 4 piezo actuator on each tuner
- Connector # 4:
 - 1 stepper motor with 2 switch tuners on each tuner
- Connector # 5:
 - 2 temperature sensors on each cavity
 - 1 temperature sensors on the thermal shield
 - 1 temperature sensors on each tuner
- Connector # 6:
 - 2 Fluxgates (on flange n°1 & n°3)
 - 2 temperature sensors on 2 support posts (on flange n°2 & n°4)
 - 1 temperature sensors on the strong-back (on flange n°2 & n°4)
- Connector # 7:
 - 2 temperature sensors on each coupler
- Connector # 8:
 - 1 cavity field probe per cavity
- Connector # 9:
 - 1 coupler field probe per coupler
- Connector # 10:
 - 1 coupler gauge per coupler



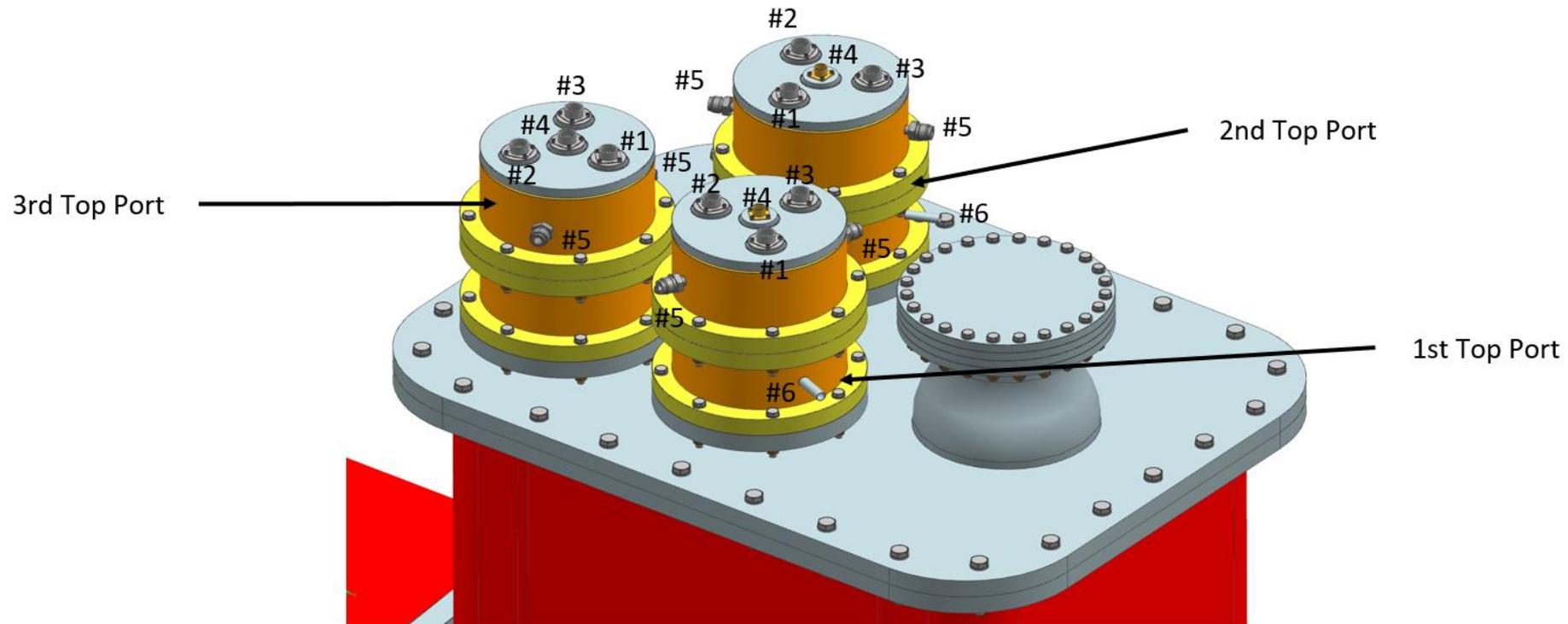




- **Connector # 1:**
 - 2 temperature sensors on the 5 K line inlet
 - 2 temperature sensors after cool down valve
- **Connector # 2:**
 - 2 temperature sensors on the 2 K line before the JT valve
 - 2 temperature sensors on the 2 K line after the JT valve
- **Connector # 3:**
 - 2 temperature sensors on the pumping line located before the heat-exchanger
 - 2 temperature sensors on the pumping line located after the heat-exchanger
- **Connector # 4:**
 - 1 temperature sensor on the thermal shield - cryogenic port – top
 - 1 temperature sensor on the thermal shield - cryogenic port – bottom
 - 1 temperature sensor on the thermal shield - cryogenic port – side plate
 - 1 temperature sensor on the thermal shield - cryogenic port – top plate

► On those 3 Top ports, additional instrumentation is implemented:

- 7 temperature sensors coming from the Helium Vessel of each cavity
- 3 fluxgates coming from the Helium Vessel of each cavity
- pressure transducers
- 2 helium level sensors



- ▶ Instrumentation is defined like for the HB650 Cryomodule.
- ▶ Instrumentation list is available on TeamCenter
- ▶ RF cables will be thermalized but layout is not yet studied
- ▶ HB650 experience will be useful to validate this instrumentation list and use the HB650 procedures, drawings ...



Thank you for your attention